

**WHAT IS CLAIMED IS:**

5 1. A permanent magnet motor including a stator having windings and a generally cylindrical permanent magnet supported on the inner surface of a rotating hub, said cylindrical magnet including a plurality of said poles of alternating magnet polarity, said alternating polarity poles being located circumferentially adjacent each of said adjacent magnetic poles being separated from a next adjacent magnetic pole of said opposite polarity by a null region which extends only partially radially through said cylindrical magnet to create a null zone between adjacent poles relative rotation of said magnet and said windings establishing a back EMF characteristic having a substantially trapezoidal shape.

10 2. A permanent magnet motor as claimed in Claim 1 wherein said motor hub supports a back iron on its inner surface, said magnet being supported on said back iron.

15 3. A permanent magnet motor as claimed in Claim 1 wherein said sequence of poles extends circumferentially around an interior surface of a cylindrical back iron supporting said magnet and each pole being separated from a next adjacent one of said poles by said null transition zone.

20 4. A motor as claimed in Claim 1 wherein each said pole is separated from an adjacent said pole by said non-magnetized transition zone of about ten to fifteen degrees of width angle.

5. A permanent magnet motor as claimed in Claim 3 wherein said null region is scalloped in cross section so that said radial extent of said null zone is minimized.

Sub  
C2

5

6. A magnetizer for magnetizing a magnet with a null zone intermediate alternating poles comprising an insulating core supporting pairs of axially directed wires, each pair of wires adapted to carry current in the same axial direction, and a back iron axially spaced from said core by a sufficient axial gap to allow said magnet to be magnetized to slip into said gap, the flux being shaped to create alternating magnetic poles separated by a null zone around said magnet.

7. A magnetizer as claimed in Claim 6 wherein said gap is of sufficient radial extent that a portion of said gap remains open when said magnet is inserted so that said transition zone of said magnet is softened.

8. A magnetizer for magnetizing a magnet with null zones intermediate alternating poles comprising  
means for supporting said magnet in said magnetizer and  
conductive means for creating a flux path through said magnet which establishes said null zones in said magnet.

10

002080" 847E960

Add  
C3

Add  
E2